

WE CLAIM:

1. A method for forming a dual damascene structure,
comprising:

5 providing a silicon substrate containing one or more
electronic devices;

forming a first dielectric layer of a first thickness
over said silicon substrate;

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forming a first etch stop layer over said first
dielectric layer;

forming a second dielectric layer of a second
15 thickness over said first dielectric layer;

forming an anti-reflective coating layer over said
second dielectric layer;

20 etching a first trench to a first depth in said second
dielectric layer wherein the first depth is greater than
the thickness of said second dielectric layer; and

simultaneously etching a second trench to a second depth in said second dielectric layer and etching said first trench in said first dielectric layer wherein the second depth is approximately equal to the second thickness and the first depth is approximately equal to the first thickness.

2. The method of claim 1 wherein said anti-reflective coating layer comprises silicon oxynitride.

3. The method of claim 1 wherein first and second etch stop layers are formed with material selected from the group consisting of silicon carbide and silicon nitride.

4. The method of claim 1 wherein said first dielectric layer is FSG.

5. The method of claim 1 wherein said second dielectric layer is FSG.

6. The method of claim 1 further comprising:

forming a liner film in said first trench and said second trench; and

forming a contiguous copper layer in said first trench and said second trench.

7. A method for forming a copper filled dual damascene structure, comprising:

providing a silicon substrate containing one or more
5 electronic devices;

forming a first dielectric layer of a first thickness over said silicon substrate;

10 forming a first etch stop layer over said first dielectric layer;

forming a second dielectric layer of a second thickness over said first dielectric layer;

15 forming a silicon oxynitride anti-reflective coating layer over said second dielectric layer;

etching a first trench to a first depth in said second
20 dielectric layer and said first dielectric layer wherein the first depth is greater than the thickness of said second dielectric layer; and

simultaneously etching a second trench to a second depth in said second dielectric layer and etching said first trench in said first dielectric layer wherein the second depth is approximately equal to the second thickness and the first depth is approximately equal to the first thickness.

8. The method of claim 1 wherein said silicon nitride anti-reflective coating layer comprises 30 to 50 atomic percent of silicon, 20 to 50 atomic percent of oxygen, 2 to 17 atomic percent of nitrogen, and 7 to 35 atomic percent of hydrogen.

9. The method of claim 1 wherein first and second etch stop layers are formed with material selected from the group consisting of silicon carbide and silicon nitride.

10. The method of claim 1 wherein said first dielectric layer is FSG.

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11. The method of claim 1 wherein said second dielectric layer is FSG.

12. The method of claim 1 further comprising:

forming a liner film in said first trench and
said second trench; and

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forming a contiguous copper layer in said first
trench and said second trench.